



BROWARD COMMUNITY COLLEGE COURSE OUTLINE

LAST REVIEW: 2008-2009 **NEXT REVIEW:** 2013-2014 **STATUS:** A

COURSE TITLE: Radiographic Process Lab

COMMON COURSE NUMBER: RAT 1111L

CREDIT HOURS: 1

CONTACT HOUR BREAKDOWN

(per 16 week term)

CLOCK HOURS:
(Voc. Course ONLY)

Lecture: Lab: **32**

Clinic: Other:

PREREQUISITE(S): RAT 1001, RAT 1614

COREQUISITE(S):

PRE/COREQUISITE(S): RAT 1111, RAT 1021C

COURSE DESCRIPTION: Practical application of radiographic imaging through exposing phantom body parts to x-radiation and image processing.

General Education Requirements – Associate of Arts Degree (AA), meets Area(s): Area
General Education Requirements – Associate in Science Degree (AS), meets Area(s): Area
General Education Requirements – Associate in Applied Science Degree (AAS), meets Area(s): Area

UNIT TITLES

- | | |
|---|--------------------------------------|
| 1. Laboratory Orientation & Radiation Safety | 7. The Radiographic Processor |
| 2. The Radiographic Darkroom | 8. Density |
| 3. Densitometer Measurement | 9. Contrast |
| 4. Beam Restriction | 10. Distortion |
| 5. Grid Utilization | 11. Detail |
| 6. Screen Fluorescence | 12. Fluoroscopy |



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EVALUATION:

Please provide a brief description (250 characters maximum) that details how students will be assessed on the course outcomes.

Assessment includes practical laboratory imaging experiments.

**** Complete the following only if course is seeking general education status ****

GENERAL EDUCATION Competencies and Skills*:

Please highlight in green font all Competencies/Skills from the list below that apply to this course. In the box to the right of the Competency/Skill, enter all specific learning outcome numbers (i.e. 1.1, 2.7, 5.12) that apply.

1. Read with critical comprehension	
2. Speak and listen effectively	
3. Speak and listen effectively	
4. Think creatively, logically, critically, and reflectively (analyze, synthesize, apply, and evaluate)	
5. Demonstrate and apply literacy in its various forms: (highlight in green ALL that apply) (1. technological, 2. informational, 3. mathematical, 4. scientific, 5. cultural, 6. historical, 7. aesthetic and/or 8. environmental)	
6. Apply problem solving techniques to real-world experiences	
7. Apply methods of scientific inquiry	
8. Demonstrate an understanding of the physical and biological environment and how it is impacted by human beings	
9. Demonstrate an understanding of and appreciation for human diversities and commonalities	
10. Collaborate with others to achieve common goals.	
11. Research, synthesize and produce original work	
12. Practice ethical behavior	
13. Demonstrate self-direction and self motivation	
14. Assume responsibility for and understand the impact of personal behaviors on self and society	
15. Contribute to the welfare of the community	

**General Education Competencies and Skills endorsed by '05-'06 General Education Task Force*



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UNITS

Unit 1 Laboratory Orientation & Radiation Safety

General Outcome:

- 1.0 The student shall be able to identify and locate radiographic equipment/accessories and discuss/demonstrate radiation safety.**

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 1.1** Discuss safety precautions for utilization of the simulator lab.
- 1.2** Demonstrate appropriate radiation safety.
- 1.3** Identify & locate the radiographic tube, control console, PSA, & generator.
- 1.4** Identify & locate radiographic accessories.
- 1.5** Operate the x-ray simulator.
- 1.6** Warm up the x-ray tube & make exposures with the simulator.



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Unit 2 The Radiographic Darkroom

General Outcome:

2.0 The student shall be able to accurately utilize a radiographic darkroom and automatic film processor.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 2.1** Discuss safety precautions for utilization of the radiographic darkroom & processor.
- 2.2** Load & unload cassettes in the radiographic darkroom.
- 2.3** Operate an automatic film processor.



UNITS

Unit 3 Densitometer Measurement

General Outcome:

- 3.0 The student shall be able to accurately utilize a densitometer for image evaluation.**

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 3.1** Discuss the functions of a densitometer.
- 3.2** Calibrate a densitometer.
- 3.4** Experimentally demonstrate the use of a densitometer; Experiment A.



UNITS

Unit 4 Beam Restriction

General Outcome:

- 4.0 The student shall be able to demonstrate & describe the effects of beam restriction on scatter radiation & image quality.**

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 4.1** Adjust radiation field size by utilizing a collimator.
- 4.2** Experimentally demonstrate & evaluate the effects of beam restriction on scatter radiation & image quality; Experiment B.



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Unit 5 Grid Utilization

General Outcome:

5.0 The student shall be able to demonstrate & describe the effects of grid usage on image quality.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 5.1** Employ a grid for imaging.
- 5.2** Experimentally demonstrate & evaluate the effects of grid usage on image quality; Experiment C.



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Unit 6 Screen Fluorescence

General Outcome:

6.0 The student shall be able to demonstrate screen fluorescence and describe its characteristics.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 6.1** Employ intensifying screens for imaging.
- 6.2** Experimentally demonstrate & evaluate fluorescence & the effects of kVp on screen speed; Experiment D.



UNITS

Unit 7 The Radiographic Processor

General Outcome:

7.0 The student shall be able to locate and identify processor systems and solutions and troubleshoot common processing problems.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 7.1 Identify the components & systems of an automatic film processor.**
- 7.2 Demonstrate development of the latent image.**
- 7.3 Troubleshoot common processor problems.**



UNITS

Unit 8 Density

General Outcome:

8.0 The student shall be able to demonstrate & describe the effects of mA, exposure time, distance, & kVp on image density.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 8.1** Experimentally demonstrate & evaluate the effects of mA on image density; Experiment E.
- 8.2** Experimentally demonstrate & evaluate the effects of exposure time on image density; Experiment F.
- 8.3** Experimentally demonstrate & evaluate the effects of distance (SID) on image density; Experiment G.
- 8.4** Experimentally demonstrate & evaluate the effects of kVp on image density; Experiment H.



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Unit 9 Contrast

General Outcome:

- 9.0 The student shall be able to demonstrate & describe the effects of kVp on image contrast.**

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 9.1** Experimentally demonstrate & evaluate the effects of kVp on image contrast; Experiment H.
- 9.2** Experimentally demonstrate & evaluate the effects of mAs and kVp on the scales of contrast; Experiment I.



UNITS

Unit 10 Distortion

General Outcome:

10.0 The student shall be able to demonstrate & describe the effects of source-to-image receptor distance (SID) & object-to-image receptor distance (OID) on size distortion and image detail.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 10.1** Experimentally demonstrate & evaluate how SID affects size distortion & image detail; Experiment J.
- 10.2** Experimentally demonstrate & evaluate how OID affects size distortion & image detail; Experiment K.



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Unit 11 Detail

General Outcome:

11.0 The student shall be able to demonstrate & describe the effects of beam angulation on shape distortion and image detail.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 11.1** Experimentally demonstrate & evaluate how beam angulation affects shape distortion & image detail; Experiment L.



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Unit 12 Fluoroscopy

General Outcome:

12.0 The student shall be able to demonstrate & describe the use of fluoroscopy for imaging.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 12.1** Experimentally demonstrate & evaluate the use of fluoroscopy for imaging; Experiment M.